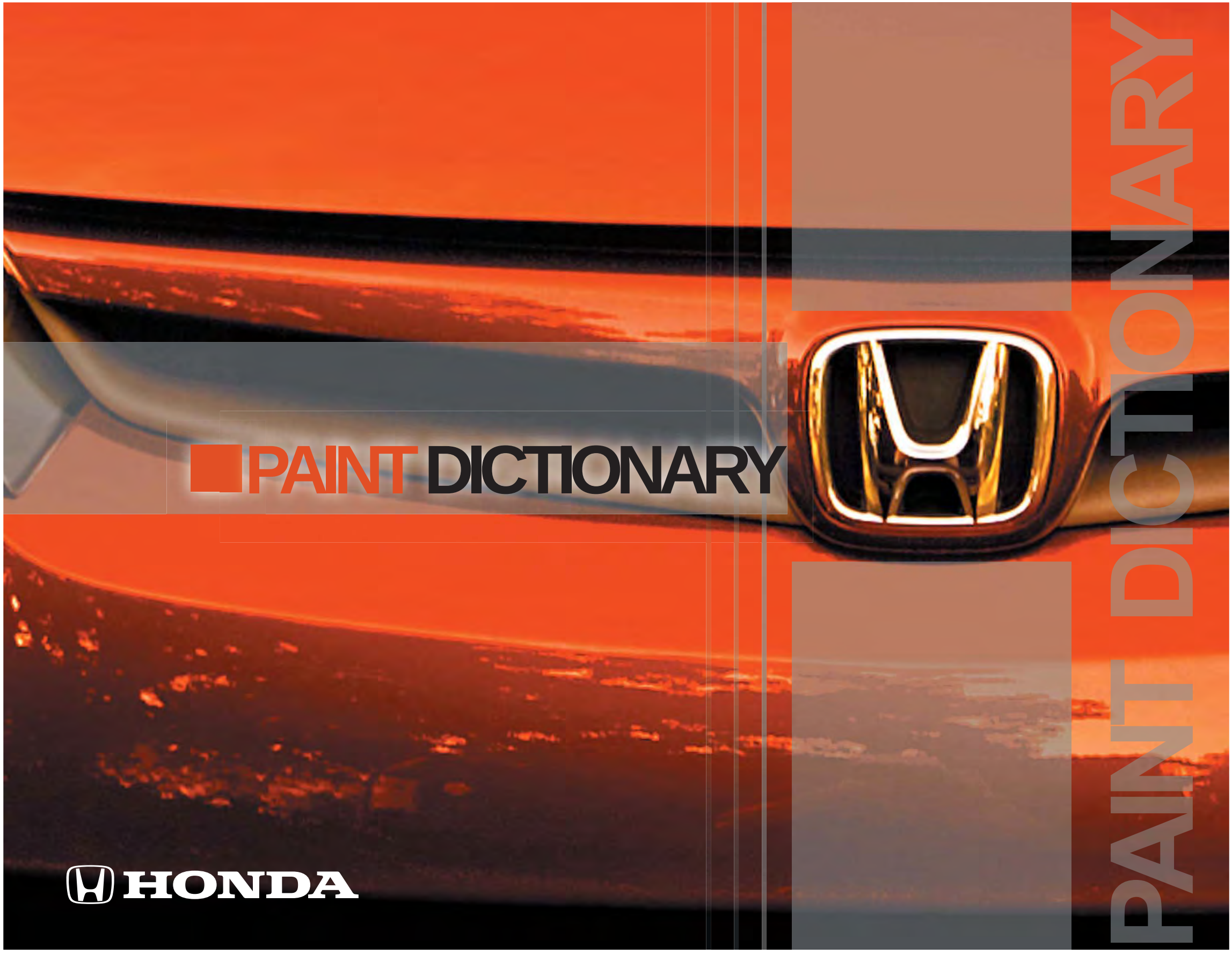
PAINT DICTIONARY
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PAINT DICTIONARY

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Intended Use

This guide will help you understand what paint is, why it is on the car, and what happens to it when it is exposed to various influences.

It is hoped that the photos and descriptions will help you when discussing paint problems with customers; what caused the problm, the best way to repair it, and how to recommend protecting the paint in the future.

History of Paint

25,000 years ago:
Cave Drawings (Decorative)

3000 to 600 BC:
Egyptians (Decorative)

6000 years ago:
Noah's ark, Pitch or Sap (Protective)

600 BC to 400 AD:
Varnish for wood (Protective)

Henry Ford:
"Any color as long as it is black" (Protection)

Honda:
- Paint and clear coat (Protection & Decorative),
- Pearls and Metallics (Decorative),
- Resin (Protection)

Composition of Paint

Resin or Binders: Early resin was tree sap, used to seal wood. Today, binders seal and hold the color pigment.

Thinners or Solvents: Thinners are carrier agents used to get the binders and pigment applied to the surface uniformly. Water is now used in some factories as a carrier agent.

Pigment: The color that you can see

Pearls and Metallics: Visual enhancement

Repair Procedures

It is important to always start with the least aggressive repair procedure and check for effectiveness. If it is not effective, try the next, slightly more aggressive procedure. Below is a list of repair procedures; 1 is the least aggressive, while 7 is the most aggressive.

1) Auto Body Paint Detail Clay to remove surface contamination.

2) Polish with Foam pad, orbital polisher, and "Finish" polishing compound.

3) Polish with Foam pad, direct drive polisher, and light polishing compound.

4) Polish with Wool pad, direct drive polisher, and medium polishing compound.

5) Polish with Wool pad, direct drive polisher, and coarse polishing compound.

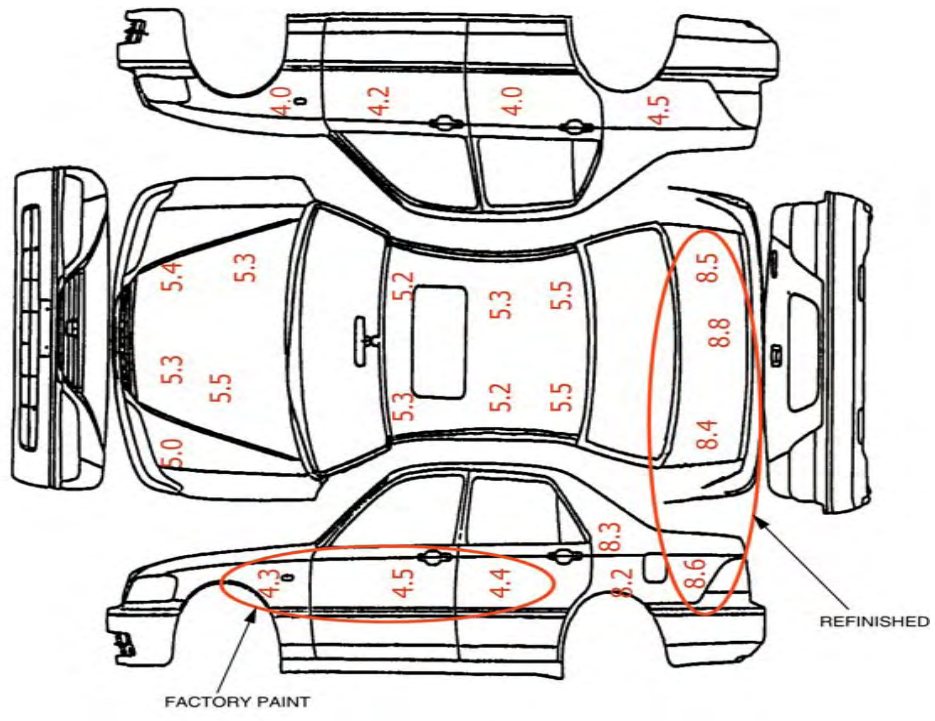
6) Color sand with 2000 to 3000 grit sandpaper that has been soaking in water, then polish with wool pad (4), then (3), then (2), etc.

7) Sand and repaint panel.

Paint Diagnosis

Outside Influence	May be warrantable, depending on age and paint source
An imperfection in or on the paint from some outside influence (May or may not get worse with age): Environment Neglect Vandalism	An imperfection in the paint from the paint application process (Usually will not get worse with age): Body Shop Factory

These are examples of magnifiers used for close inspection of paint conditions. More examples of these tools can be found at *www.paintmeter.com, www.defelsko.com,* and *www.radioshack.com*



Factory paint thickness is 4 to 6 mils (100 to 150 microns). Panels with more than 4 to 6 mils (100 to 150 microns) have been refinished.

Top Surface Deposits:

Tree Sap Resin

Visual Inspection:

A white or yellow hard, semi-transparent resin that may scratch off to a powder. When cleaned off, the paint may appear to be swelled, etched, or cracked.

Cause:

Chemicals in the tree sap leach into the paint.

Repair:

• Body Paint Detail Clay to remove the sap.

• Polish to remove the etch; color sand if necessary.

• Sand and repaint to repair the cracking.

Prevention:

Wash with soap and water, use “Insect and Tar Remover,” if necessary.

Top Surface Deposits:

Paint Overspray

Visual Inspection:
Small spots on the paint, moldings, and glass that may feel rough to the touch. The overspray may not affect the entire vehicle.

Cause:
Airborne liquid has fallen on the vehicle and dried.

Repair:
Body Paint Detail Clay. (Be aware that detail clay can sometimes make low gloss moldings more glossy.)

Prevention:
Avoid areas where paint is being applied, such as buildings, street striping, and industrial areas.

Top Surface Deposits:

Rail Dust or Industrial Fallout

Visual Inspection:
Small 0.5-mm to 1-mm yellow or orange spots that may feel rough to the touch.

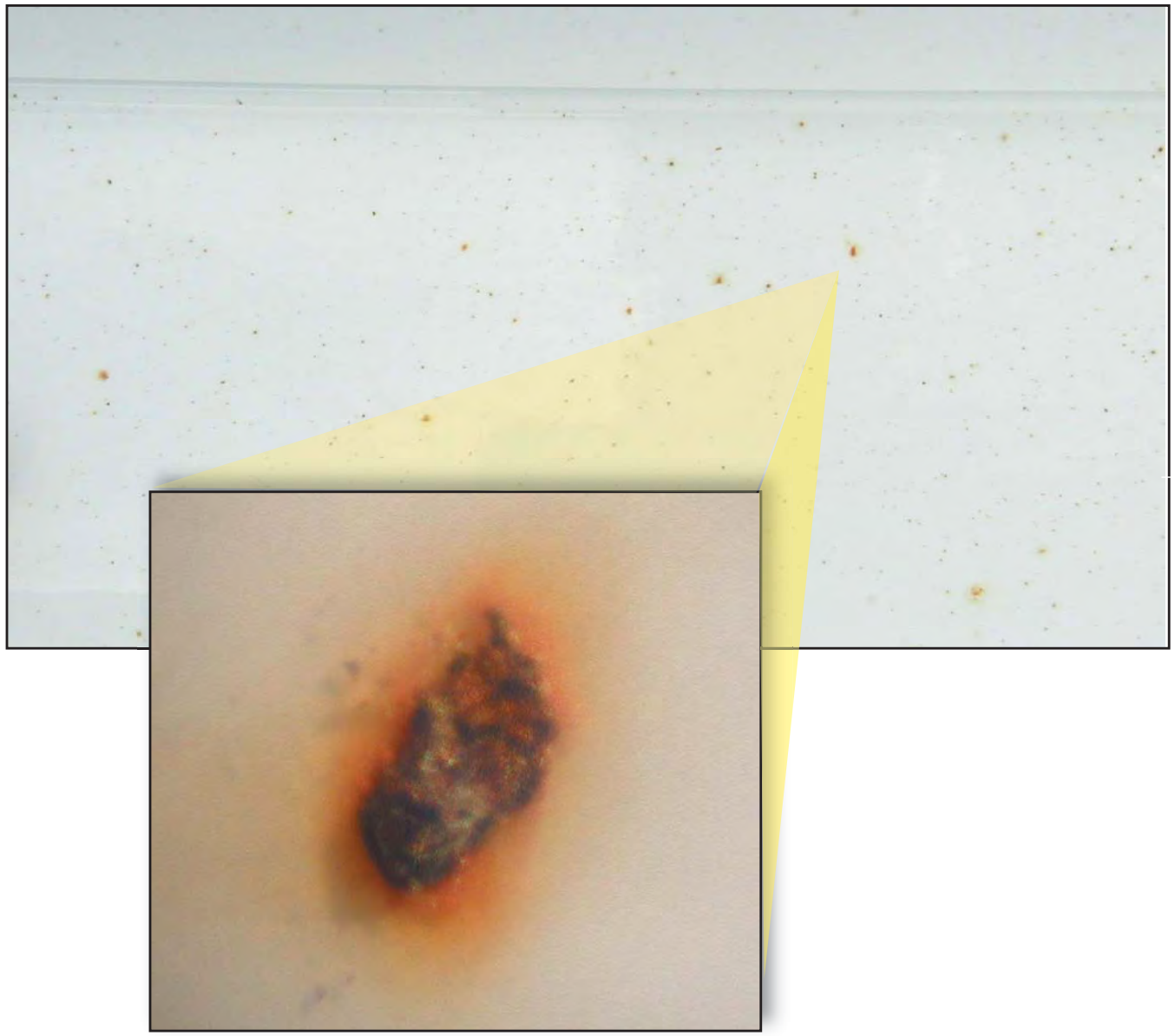
Cause:
Iron particles from industrial areas are carried through the air and fall on the paint. They are affected by moisture, causing the iron to oxidize and stick to the paint. Continued oxidization causes the yellow spots to get larger and the iron particles to stick more firmly.

Damage:
Mostly cosmetic; some severe cases may etch the surface and stain the paint.

Repair:
Auto Body Paint Detail Clay to remove the iron; polish to remove the rust spot.

Prevention:
Wash regularly.

Note: Since this condition is caused by airborne pollution, recurrence is likely if the vehicle is consistently parked in the same area and not protected.



30 X magnification

Top Surface Etching:

Bird or Bat Droppings

Visual Inspection:
Rough areas on the surface of the paint prevent the paint from reflecting light uniformly. In severe cases, it may cause cracking or checking of the paint.

Cause:
High acidic or alkaline chemicals from the food the animal has eaten etches the surface of the paint.

Repair:
• Polish the surface of the paint to bring back the gloss. If the condition is extreme, color sand to remove ¾ of the roughness. Ensure that no more than 0.5 mil (12 microns) is removed. Polish to restore gloss.

• Sand and repaint if the condition is severe.

Prevention:
Wash regularly.

Top Surface Etching:

Acid Rain / Water Spots

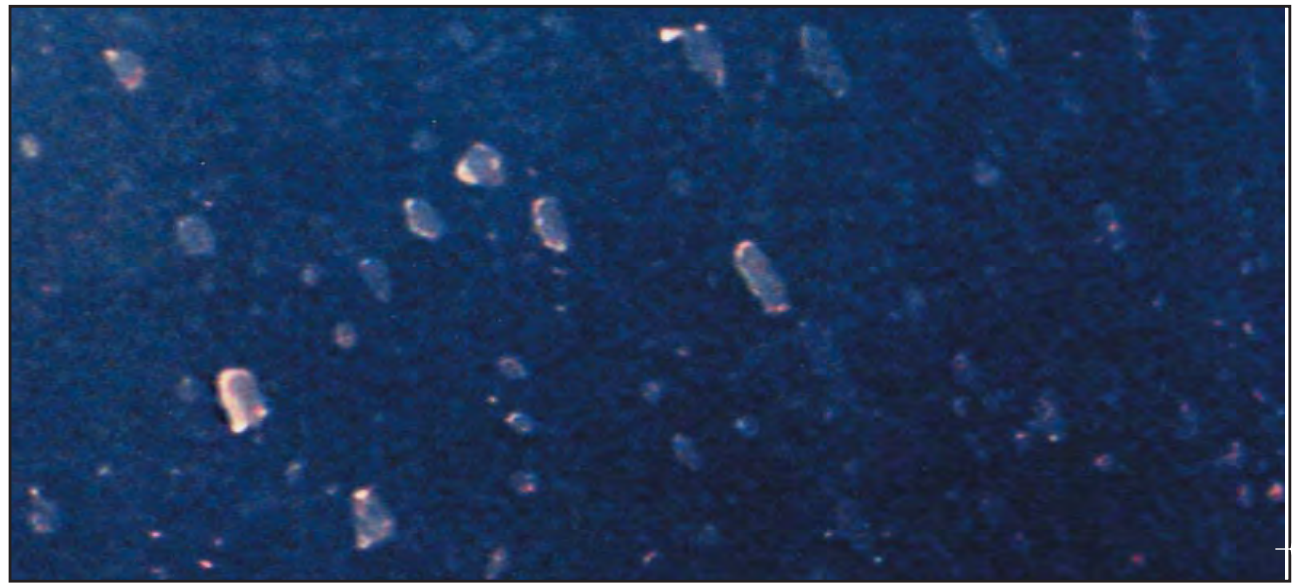
Visual Inspection:
Water spots on the surface of the paint. In severe cases, it may cause cracking or checking of the paint.

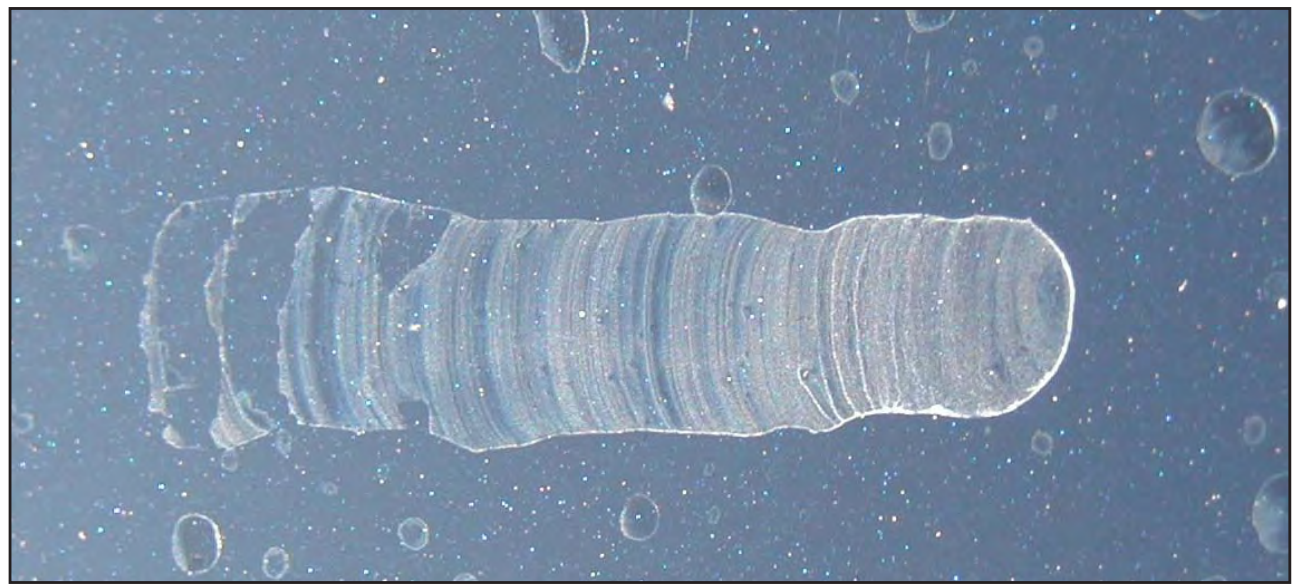
Cause:
Rain water that is acidic or alkaline etches the surface of the paint. As the water evaporates, it makes successively smaller rings where the moisture becomes more concentrated, with a severe etch spot at the point where the drop dries.

Repair:
• Polish the surface of the paint to bring back gloss or, if necessary, color sand to remove ¾ of the etched area, then polish to restore the gloss. Ensure that no more than 0.5 mil (12 microns) is removed.

• Sand and repaint if the condition is severe.

Prevention:
Wash regularly.





Top Surface Scratches/Chips:

Swirl Marks & White Spots

Visual Inspection:
Cloudy or hazy appearance caused by small microscopic scratches in the surface of the paint. When the sunlight hits, it reflects off these scratches and scatters in different directions.

Cause:
Polishing a newly painted surface.

Repair:
• Polish with finer rubbing compound using a "Waffle" pad.

• Use a "Fill-in Glaze" to minimize the effect of light reflection.

Prevention:
Never wipe the painted areas of a vehicle with a dry towel or cloth. Always rinse off the vehicle before washing.

Top Surface Scratches/Chips:

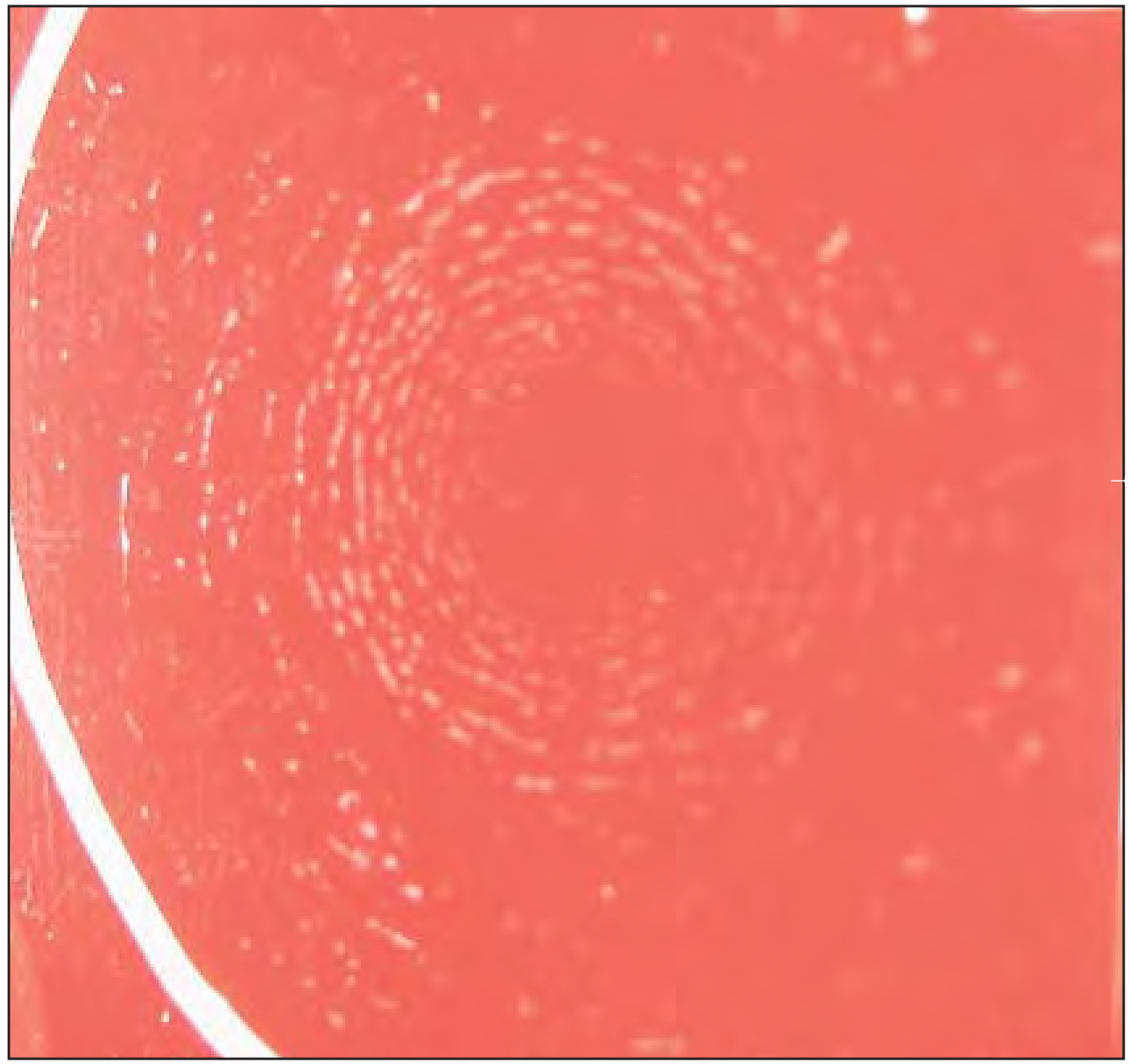
Egg Shell

Visual Inspection:
There are chips in the paint in successively larger circles.

Cause:
When an egg hits a painted surface, the shell cracks, exposing a sharp edge. That edge digs into the paint and then cracks, exposing a new edge. The pattern is repeated as the edge digs into the paint and then breaks off, until the precise size of the egg shows as circles in the paint.

Repair:
• Polish if the scratches are on the surface.

• If the paint is chipped, sand and repaint.



Top Surface Scratches/Chips:

Rock Chips

Visual Inspection:

Through a magnifier, the paint looks like shattered glass.

Cause:

Paint is brittle and will chip when hit by rocks. Soft paint, when hit by sand and gravel, may not chip but the surface may be marred. Repeated marring from sand and gravel makes the surface lose its gloss. The harder the paint, the more it is prone to chip.

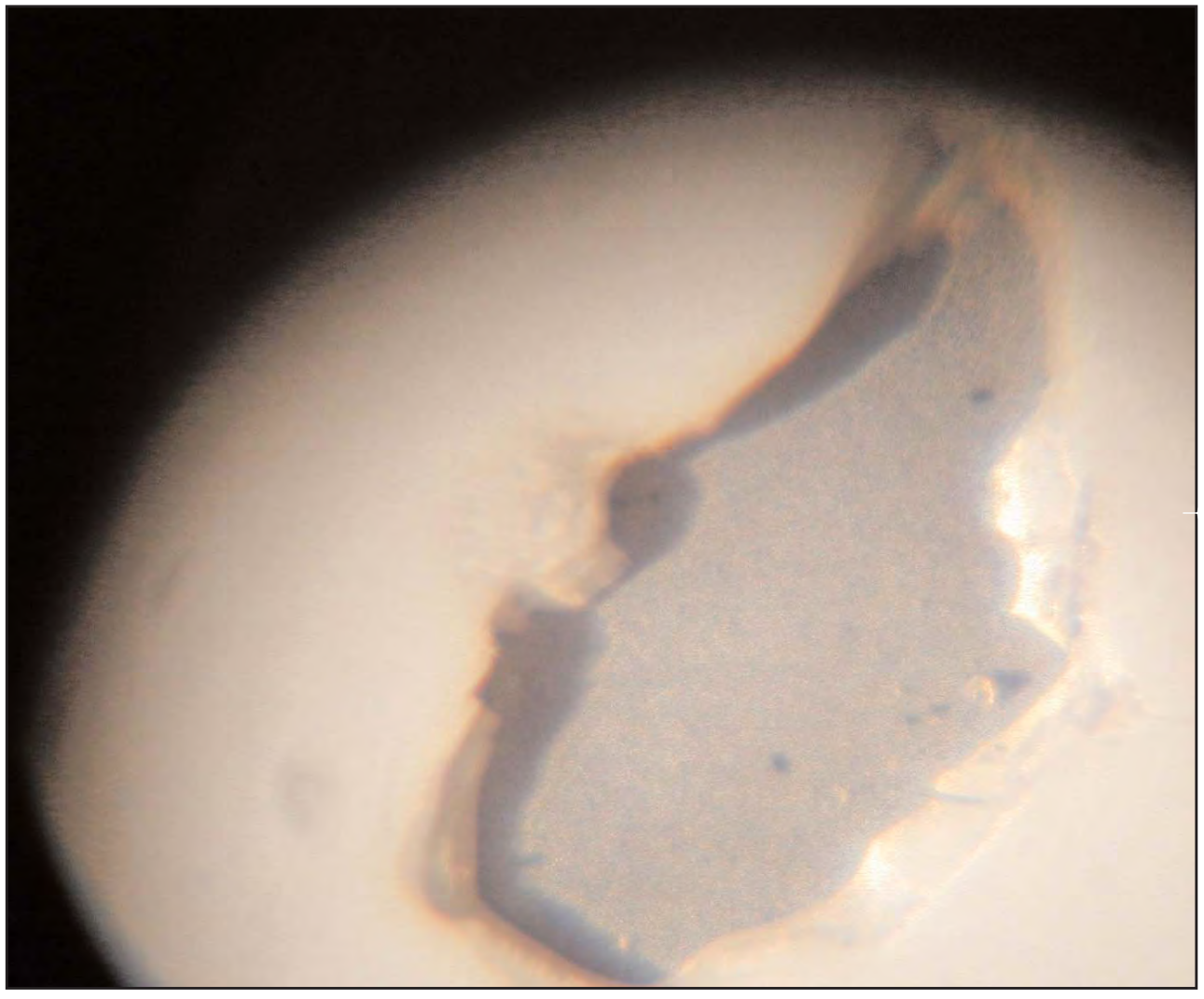
Paint will chip and mar before the windshield will chip. If a vehicle has rock chips in the paint, look at the windshield for evidence of severe marring or chipping caused by sand and gravel.

Repair:

Sand and repaint.

Prevention:

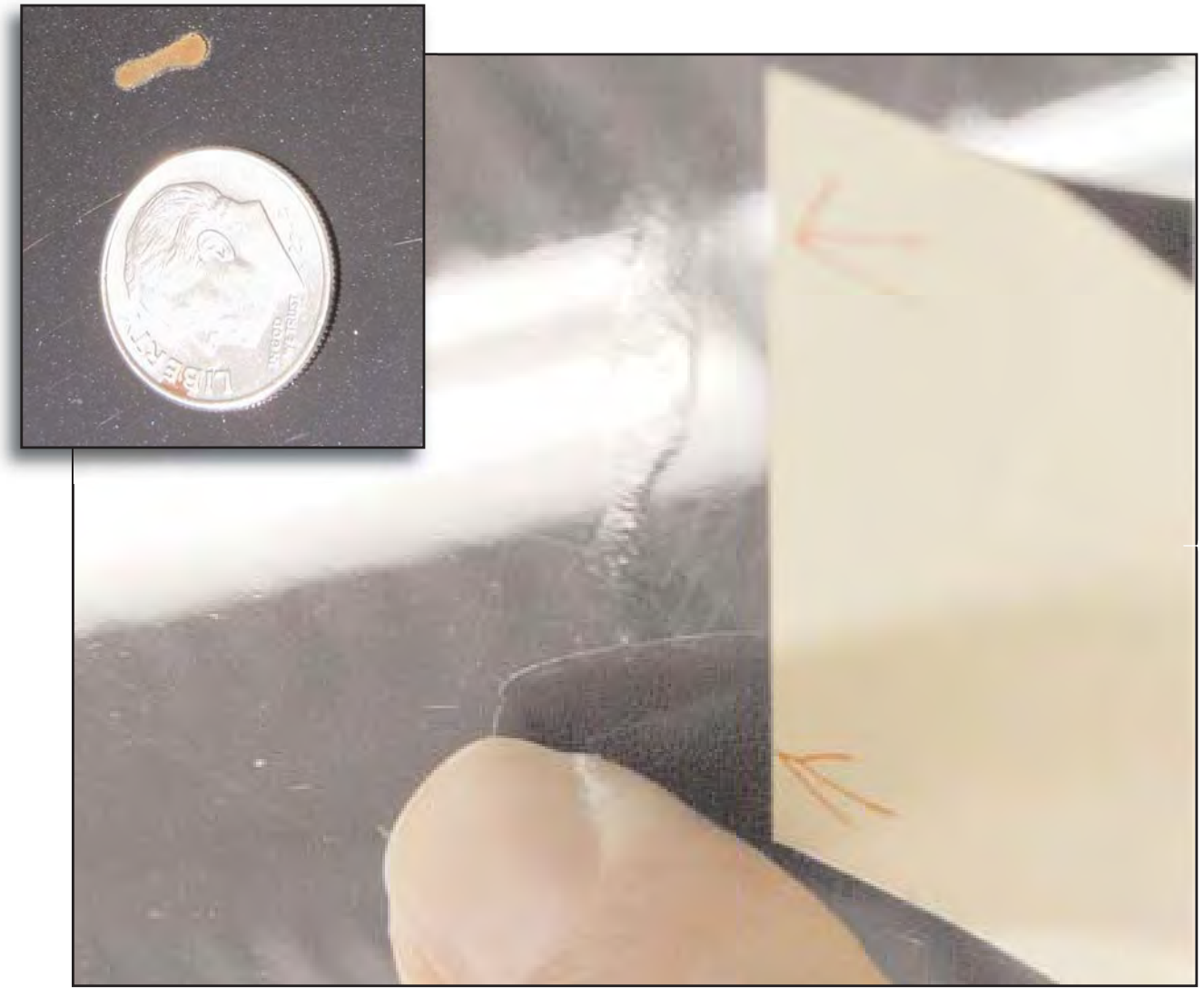
Use a nose mask to protect the bumper and hood. In a construction zone or on gravel roads, keep a greater distance between you and the vehicle in front of you.



30 X Magnification

Paint Swelling:

Bee Droppings



Visual Inspection:

Bee droppings are 2- to 4-mm diameter round, or 1-mm by 4-or 5-mm oblong, yellow crusty deposits. The most common result of bee droppings is paint swelling. This swelling usually cannot be seen on light color cars, but may show on dark blue or black cars. The swelled area is the same shape as the yellow spot and causes a disruption in the reflection of the surface gloss.

Cause:

Swelling of the paint.

Repair:

Block color sand with 2000 or 3000 grit sand paper to remove about 50 percent of the swelling, then polish.

Prevention:

Wash regularly.

Paint Swelling:

Brake Fluid

Visual Inspection:
Depending on the technology of the paint, brake fluid may cause swelling, a “wrinkle” appearance, or may lift the paint off the metal.

Cause:
Chemicals leaching into the paint.

Repair:
Wash to neutralize the brake fluid, then sand and repaint if necessary.

Prevention:
Wash off as soon as contaminated.

Top or Undersurface:

Mold

Visual Inspection:
Paint is porous. Moisture will penetrate the surface of the paint if the moisture is held in place by dirt, tree leaves, nose masks, etc.

Cause:
Mold will stain the surface of the paint if allowed to grow on or in the paint.

Repair:
Sand and repaint.

Prevention:
Wash regularly, and wipe the inside of the trunk, door, and hood openings.

Top or Undersurface:

Rust Blisters

Visual Inspection:
Rock chips allow moisture to get down to the metal and begin the rust process. Rust will travel under paint like a tree root travels under a sidewalk.

Cause:
• Surface rust is from the lack of protection.
• Blisters are from rust traveling under and lifting the paint.

Repair:
Sand and repaint.

Prevention:
• Touch up all rock chips as soon as they happen.

• Wash the car regularly.

Top or Undersurface:

Moisture Stains

Visual Inspection:
Cloudy spots or a change in pigment color in the paint.

Cause:
Moisture penetrates into the film of the paint. This can be caused by nose masks, car covers, or shipping protection holding moisture next to the paint.

Repair:
Use a heat gun to warm the panel and force the moisture out of the paint. Repeated applications of heat may be required.

Prevention:
Ensure that the vehicle is not stored or operated with any moisture held on the paint by some other material.

Age-Related:

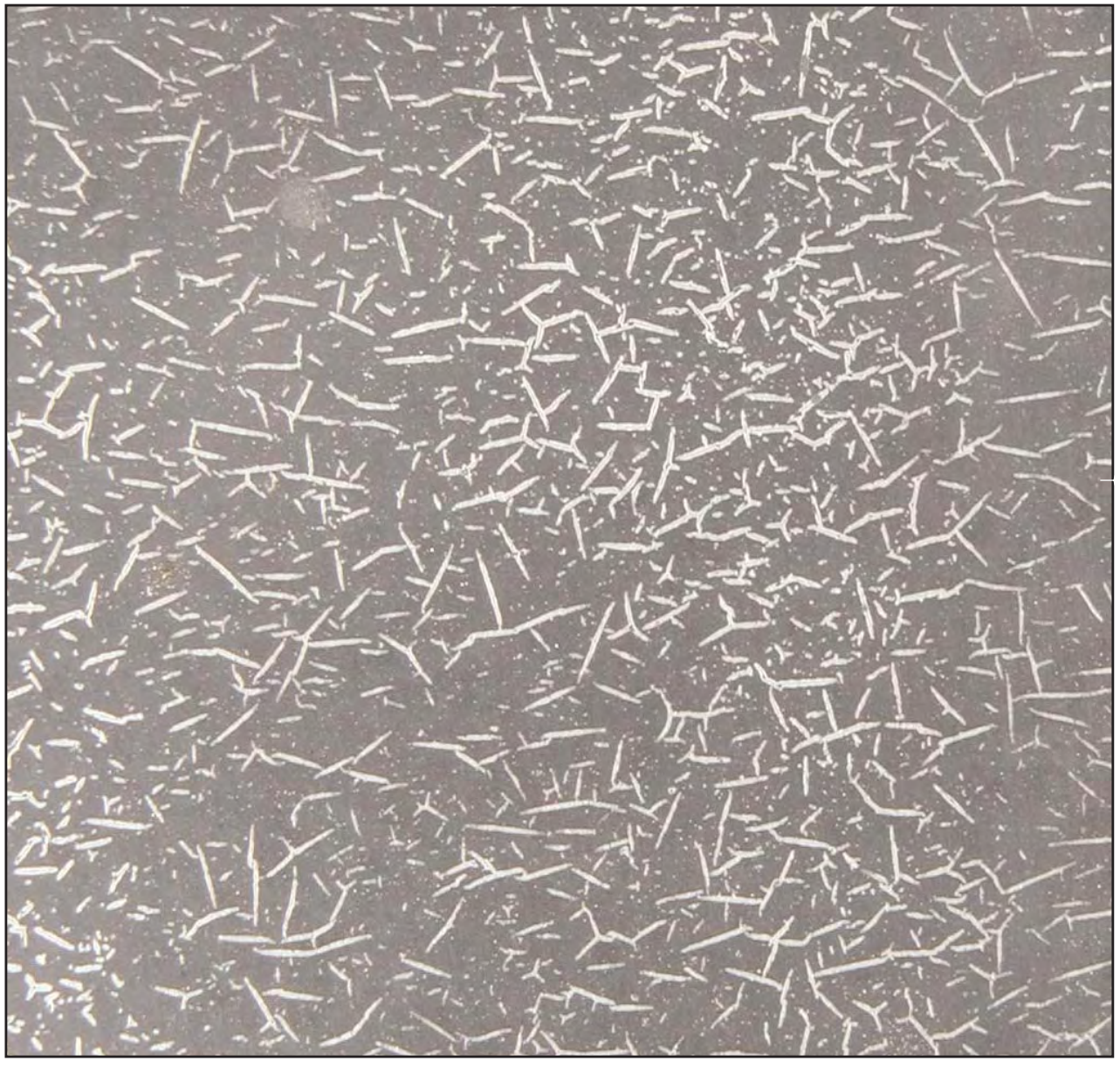
Crazing/ Cracking

Visual Inspection:
Small 3- to 7-mm long cracks in the paint, giving the appearance of a dry lake bed, and exposing the primer under the color coat.

Cause:
Usually caused by a combination of chemical contamination, age, UV light, and excessive paint thickness. Factory-applied paint will very rarely have this problem.

Repair:
Completely remove the affected paint by sanding, then repaint.

Prevention:
Prevention is difficult.



Age-Related:

Clear Coat Degradation

Visual Inspection:
The surface of the paint looks chalky and is getting progressively worse with time.

Cause:
• Sometimes caused by excessive polishing, thinning the clear coat.

• Can also be caused by poor maintenance, UV light exposure, and oxidation.

Repair:
Completely remove the affected paint by sanding, then repaint.

Prevention:
Do not remove more than 0.5 mil (12 microns) of clear coat during any cosmetic polishing activity.

Age-Related:

Delamination or Peeling

Visual Inspection:
A large section of paint is peeling off of the panel.

Cause:
Most peeling is caused by poor preparation of the base material, or repainting with incompatible paint. Delamination on the front of a vehicle can be started by a rock chip but should not continue to peel.

Test:
Apply masking tape to the area that is peeling and then pull off the masking tape. The paint should not peel off of the car.

Repair:
Sand the peeling panel completely and repaint using the paint manufacturer's paint "system".

Prevention:
None.

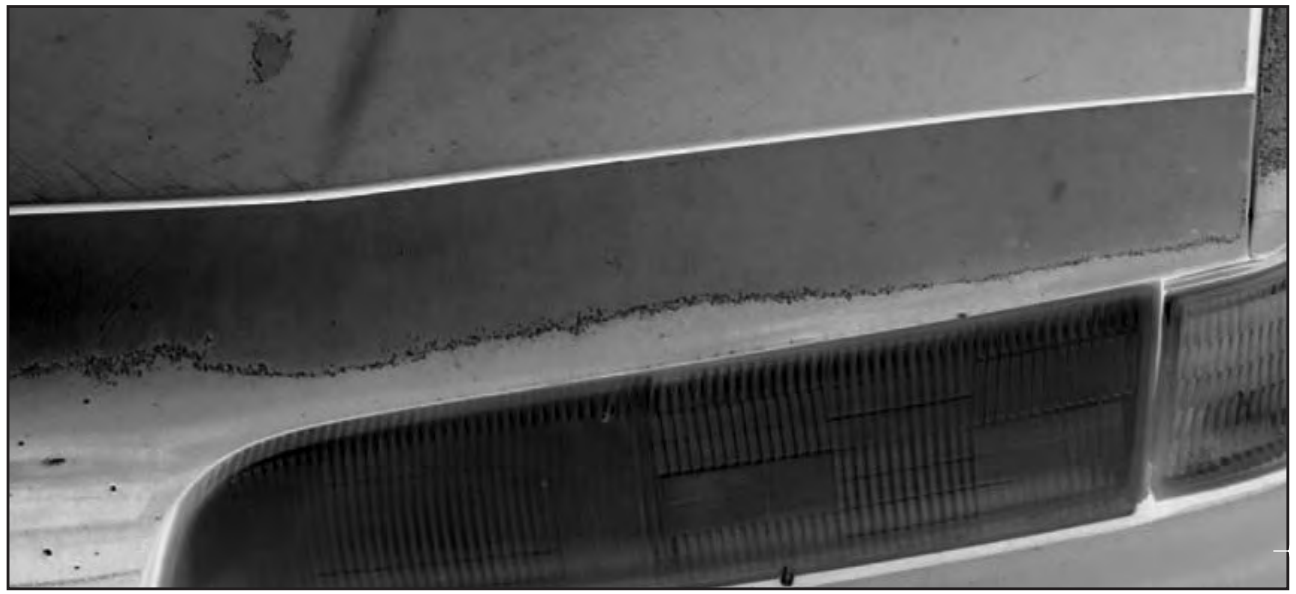
Age-Related:

Ultraviolet Light

Visual Inspection:
Years of exposure to UV light may cause the surface of the paint to look oxidized and faded.

Repair:
Replace plastic parts, sand and repaint body parts.

Prevention:
Garage and/or use car covers as much as possible.



Dirt in Paint

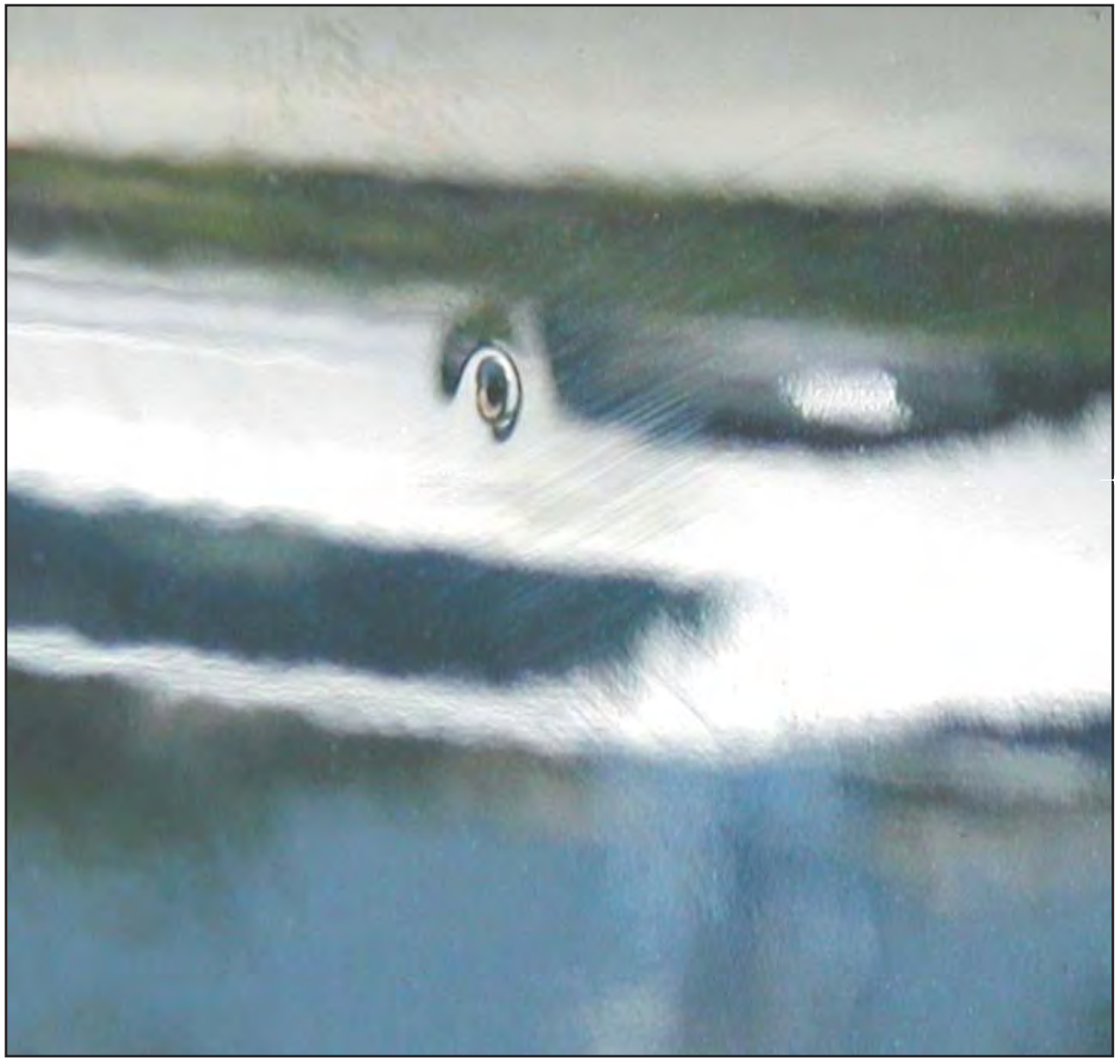
Visual Inspection:
A small raised area, usually smaller than 1 mm, will change the reflection qualities of the surface gloss.

Cause:
Dirt on the surface of the vehicle while it was being painted, or dirt settling on the paint just after the car was painted.

Repair:
Color sand with 2000 to 3000 grit wet sandpaper, then polish.

Diagnosis:
Measure the paint thickness to determine if it is factory paint.

Prevention:
None for the customer.



Fish-eye / Surface Contamination

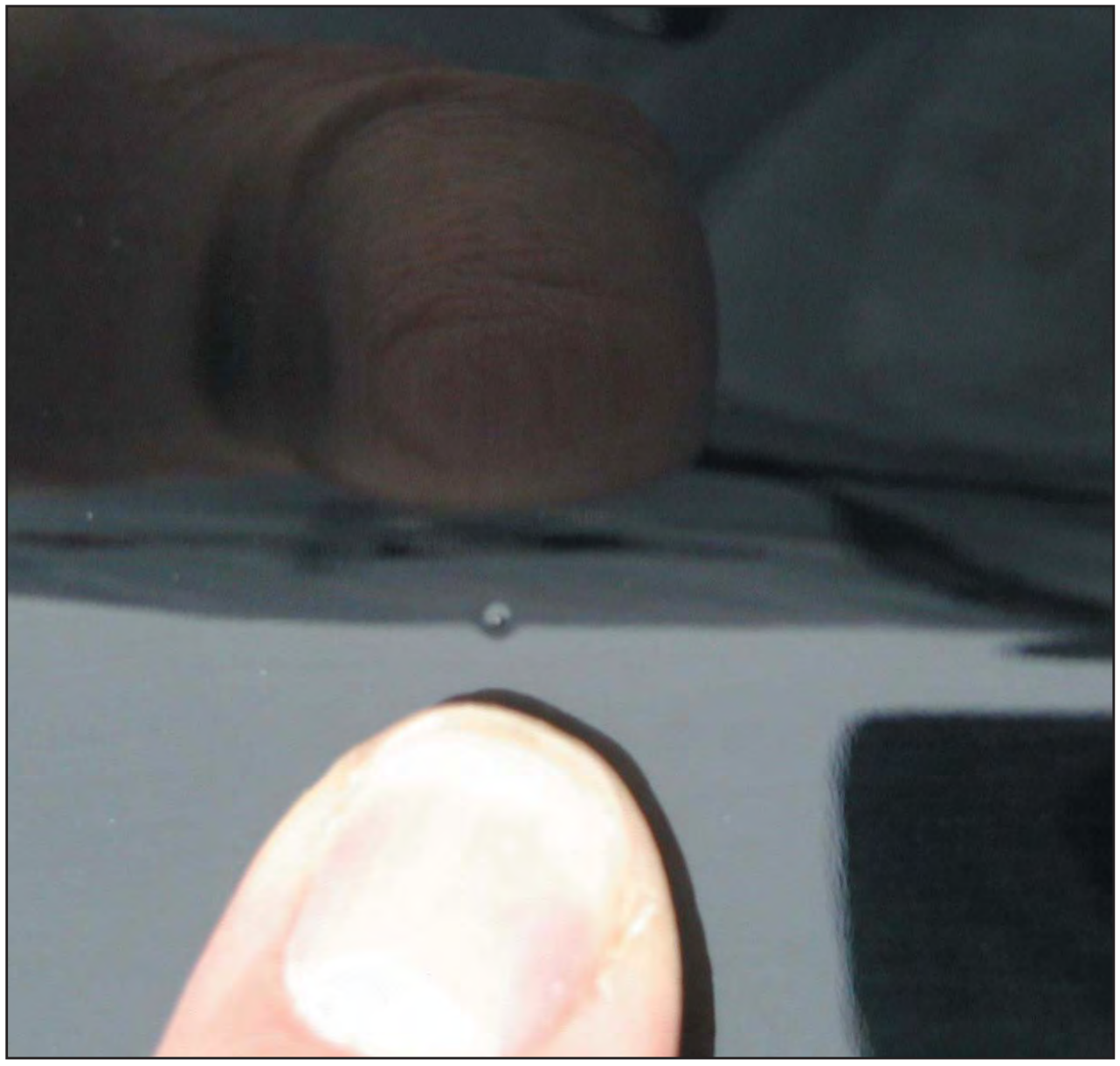
Visual Inspection:
A small crater in the paint that changes the reflection qualities of the surface gloss.

Cause:
Contamination on the surface of the car just before it was painted caused the paint to be repelled from that spot.

Repair:
Sand and repaint.

Diagnosis:
Measure the paint thickness to determine if it is factory paint.

Prevention:
None for the customer.



Orange Peel

Visual Inspection:
The reflection of objects on the paint surface looks slightly blurry. Most mass-produced vehicles will have orange peel. More expensive luxury vehicles may be sanded and polished at the factory, so the surface will have more of a glass-like reflection.

Cause:
When the vehicle is sprayed, the paint does not "flow out" completely.

Repair:
If the vehicle has excessive orange peel, it is possible to minimize it by color sanding and then repolishing. Removal of more than 0.5 mil (12 microns) may leave the vehicle susceptible to clear coat degradation in the future.

Prevention:
None for the customer.

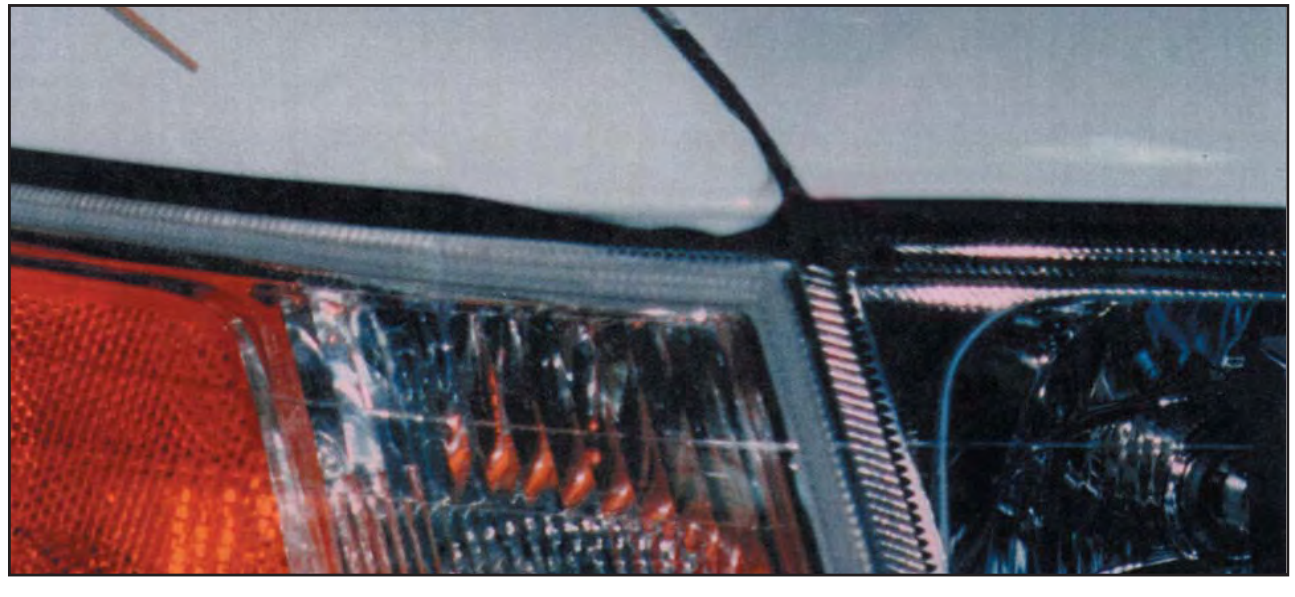
Runs, Drips, & Sags

Visual Inspection:
An abnormal appearance in the paint caused by the paint moving while it was still wet. Measure the paint thickness to determine if it is factory paint.

Cause:
Excessive amount of paint was applied.

Repair:
Sand and repaint.

Prevention:
None for the customer.



Scratches Under the Topcoat

Visual Inspection:
Lines in the paint interrupt the reflection. Measure the paint thickness to determine if it is factory paint.

Cause:
Poor preparation of the surface before the paint was applied.

Repair:
Sand completely through the paint and the subsurface, then repaint.

Prevention:
None for the customer.

Thin Paint or Poor Hiding

Visual Inspection:
The color does not look uniform because the primer is showing through in some areas. Measure the paint thickness to determine if it is factory paint.

Cause:
Thin application of the color coat.

Repair:
Sand and repaint.

Prevention:
None for the customer.

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